REMARKS

In the Office Action of March 16, 2007, claims 1-6 and 14-22 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the enablement requirement. Claim 1 includes limitations of "forming symbols using a multiple of a predetermined number of bits per symbol if the data rate is above the threshold; and allowing symbols to be formed using any integer number of bits per symbol if the data rate is below the threshold." The Examiner asserts that the specification does not enable one skilled in the art to make or use the claimed invention of forming symbols using any integer number of bits. Applicant submits that "allowing symbols to be formed using any integer number of bits per symbol (as opposed to a multiple of a predetermined number of bits per symbol) if the data rate is below the threshold" is enabled in the specification at, for example, page 8, lines 11-26, referring to Figure 5. This aspect of the invention is further enabled at, for example, page 5, line 15 – page 6, line 7, which states that the number of bits per symbol should be a multiple of 1 depending on the result of the comparison of the data rate to the threshold. Of course, saying that the number of bits per symbol should be a multiple of 1 is equivalent to allowing any integer number of bits per symbol. This aspect of the invention is further supported in the specification at page 2, lines 4-7, which states, "it has been proposed in forthcoming revisions to the current standards that the total number of bits, L, per symbol be allowed to be any integer (i.e., arbitrary), rather than simply a multiple of 8." The Examiner argues that "the maximum number of bits which may be contained within a symbol is a function of, among other things, the channel integrity, signal to noise ratio, channel fading, and channel crosstalk. Therefore, one skilled in the art is not enabled by the specification to form a symbol of, for instance, a million bits because such transmission rates are functionally and realistically not possible as understood by one having skill in the art without undue experimentation." Applicant submits that this reasoning is flawed for a multitude of reasons that will be explained below.

First of all, claim 1 does not *require* the formation of symbols with a very high (for instance, a million) number of bits. Rather, the claim calls for "*allowing* symbols to be formed using any integer number of bits per symbol if the data rate is below the threshold." Therefore, it is not necessary for the specification to enable the formation of symbols having, for instance, a

million bits. Nevertheless, Applicant submits that one of ordinary skill in the art would be able to implement the formation of symbols having large numbers of bits without undue experimentation. Secondly, the Examiner appears to argue that the *transmission* of symbols having, for instance, a million bits is not possible without undue experimentation. However, claim 1 does not claim the *transmission* of symbols having any number of bits. Instead, it claims the *formation* of symbols having any number of bits (if the data rate is below the threshold). Therefore, it is not necessary for the specification to enable the *transmission* of symbols having, for instance, a million bits, let alone the *successful* transmission (i.e., transmission without excessive noise, channel fading or channel crosstalk) of symbols having, for instance, a million bits. Furthermore, the Examiner argues that forming a symbol of, for instance, a million bits is not enabled "because such transmission rates are functionally and realistically not possible." However, claim 1 does not talk about transmitting the formed symbol at any particular transmission rate. Therefore, it is not necessary that the specification enable any given transmission rate. Finally, Applicant disputes the examiner's conclusory assertion that it is not realistically possible to transmit a symbol having, for instance, a million bits. Applicant submits that it is in fact quite possible and that one of ordinary skill in the art would be readily able to implement such a transmission. Applicant requests that the Examiner show why it is not realistically possible.

Also in the Office Action, Claims 13-20 and 22 were rejected under 35 U.S.C. § 112, first paragraph, as failing to comply with the written description requirement. The Examiner asserts that claim 13 as amended is not supported bye the specification. Claim 13 is amended herewith to correct a transcription error. Applicant submits that claim 13 is fully supported at, for example, page 5, line 15 – page 6, line 7.

Also in the Office Action, claims 1-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 6,546,090 (hereinafter, Bremer) in view of U.S. Patent No. 6,262,994 (hereinafter, Dirschedl), and in further view of U.S. Patent No. 6,549,520 (hereinafter, Gross). Claim 1 includes steps of "obtaining a data rate during initialization" and "comparing the data rate to a threshold." On page 4 of the Office Action, the Examiner asserts that Dirschedl teaches obtaining information regarding the data rate during initialization at col. 2, line 63 – col. 3, line 9, which talks about determining an error rate. Applicant strongly disagrees with this

assertion and submits that an error rate does not constitute information regarding the data rate. But more importantly, this point is moot because claim 1 no longer refers to "obtaining information regarding a data rate," but rather refers simply to "obtaining a data rate."

On page 5 (2nd paragraph) of the Office Action, the Examiner acknowledges that Dirschedl does not teach "obtaining a data rate," but goes on to make the incredibly strained argument that an error rate is the known functional equivalent to a data rate. Applicant wholly disagrees with this assertion. In transmission systems, error rate indicates the number of erroneous bits per number of bits transmitted, whereas data rate indicates the number of bits transmitted in a given time. These are in no way functionally equivalent. To support his argument that an error rate is the known functional equivalent to a data rate, the Examiner cites col. 4, lines 29-33, of Gross, which reads, "Preferably, this is the maximum data rate that can be provided for the particular communications subchannel, subject to predefined constraints such as maximum bit error rate, maximum signal power, etc. that may be imposed by other considerations." Applicant submits that the cited excerpt from Gross in no way supports the Examiner's contention that an error rate is the known functional equivalent to a data rate. At best, this excerpt from Gross is saying that an error rate can have an effect on the maximum data rate that can be achieved in a system, and that is certainly not equivalent to saying that a data rate and an error rate are equivalent, as stated by the Examiner. The Examiner further contends that col. 4, lines 29-33, of Gross suggest "to substitute information regarding a data rate (i.e. error rate) with a data rate." To the extent that this assertion makes any sense, the assertion is patently false and a gross mischaracterization of the cited excerpt from Gross. The Examiner further supports his argument by alleging a parallel between error rate and maximum receive data rate. However, claim 1 does not refer to a "maximum receive data rate," but instead simply to the "data rate."

On page 4 of the Office Action, the Examiner asserts that Dirschedl teaches "forming symbols (i.e., 2, 4 or 8 bit symbols) using a multiple of a predetermined number (i.e. 2) of bits if the information is above the threshold (col. 2, line 45); and transmitting symbols using an integer number of bits per symbol if the information is below the threshold (col. 2, line 45)." Applicant submits that this assertion is not accurate. Col. 2, line 45, of Dirschedl refers to using different types of modulation, namely 2PSK (binary phase-shift keying), 4PSK (quadrature phase-shift

keying) or 8PSK (8-phase phase-shift keying). In the PSK nomenclature, the number in front of the "PSK" refers to the number of phases employed in the phase-shift keying modulation scheme. It does not refer to the number of bits employed per symbol.

Dirschedl also talks about determining the packet size based upon the error rate determination (col. 2, line 63 - col. 3, line 9). Applicant points out that determining packet size and determining symbol size are unrelated endeavors. Applicant submits that Dirschedl does not teach or suggest "forming symbols using a multiple of a predetermined number of bits per symbol if the data rate is above the threshold; and allowing symbols to be formed using any integer number of bits per symbol if the data rate is below the threshold" per claim 1.

Claim 1 also specifies that the data rate upon which the operations of the claim are based is obtained during initialization. This is yet another limitation that distinguishes claim 1 over the methods of Dirschedl. Dirschedl nowhere refers to performing its methods during the initialization stage. All indications are that the methods are Dirschedl are performed dynamically during normal operation of the device. Col. 3, lines 9-12, of Dirschedl states, "Given the setup of the connection, averages of the setting variables, which can be selected, are first set, for example, to a medium size of packet, the type of modulation 8PSK, a FEC code arte of ½, and the highest transmitter power." Thus the variables in Dirschedl are initially set at predetermined values, rather than determined based on the error rate determination. The paragraph at col. 3, lines 13-25, indicates that after these initial settings are set at the predetermined values, the variables are adjusted automatically based on the error rate determination during normal operation of the device. This is yet another aspect of claim 1 that distinguishes over the cited art.

For at least the above reasons, Applicant submits that claim 1, and claims 2-6 and 21 depending therefrom, are allowable over the cited art.

Claim 7 includes limitations similar to those included in claim 1. Applicant submits that claim 7, and claims 8-12 and 22 depending therefrom, are allowable over the cited art for the reasons set forth above with respect to claim 1.

Claim 13 is amended herewith to correct a transcription error. Claim 13 as amended is directed to:

13. An ADSL modem system comprising:

a first modem having a first transmitter and a first receiver; and

a second modem having a second transmitter and a second receiver, the second modem operable to estimate a maximum receive data rate of the second modem and compare it to a threshold, the second transmitter transmitting a message to the first receiver that instructs the first transmitter to transmit data using a pre-selected number of bits per symbol if the maximum receive data rate is above the threshold, the second transmitter transmitting a message to the first receiver that instructs the first transmitter that it is free to transmit data using any integer number of bits per symbol if the maximum receive data rate is below the threshold.

The Examiner acknowledges on page 8 of the Office Action that Bremer in view of Dirschedl fails to teach a modem that estimates a maximum receive data rate per claim 13. The Examiner argues Dirschedl teaches a modem that estimates an error rate and argues that an error rate is an art accepted equivalent to a maximum achievable data rate, citing the excerpt of Gross as applied to claim 1 above. Applicant disputes the Examiner's assertion that an error rate is an art accepted equivalent to a maximum receive data rate. To support his argument, the Examiner cites col. 4, lines 29-33, of Gross, which reads, "Preferably, this is the maximum data rate that can be provided for the particular communications subchannel, subject to predefined constraints such as maximum bit error rate, maximum signal power, etc. that may be imposed by other considerations." Applicant submits that the cited excerpt from Gross in no way supports the Examiner's contention that an error rate is the known functional equivalent to a maximum receive data rate. At best, this excerpt from Gross is saying that an error rate can have an effect on the maximum data rate that can be achieved in a system, and that is certainly not equivalent to saying that a maximum receive data rate and an error rate are equivalent. On page 5 of the Office Action, the Examiner further contends that col. 4, lines 29-33, of Gross suggest "to substitute information regarding a data rate (i.e. error rate) with a data rate." To the extent that this assertion makes any sense, the assertion is patently false and a gross mischaracterization of the cited excerpt from Gross.

Claim 13 as amended also includes "the second transmitter transmitting a message to the first receiver that instructs the first transmitter to transmit data using a pre-selected number of bits per symbol if the maximum receive data rate is above the threshold, the second transmitter

transmitting a message to the first receiver that instructs the first transmitter that it is free to transmit data using any integer number of bits per symbol if the maximum receive data rate is below the threshold." Applicant submits that this aspect of claim 1 is not taught or suggested by the cited art. On page 7 of the Office action, the Examiner asserts regarding Dirschedl, "According to the success/fail determination, the number of bits per symbol is updated according to the possible bit rates of 2, 4, or 8 bits per symbol at the transmitter." Applicant submits that this assertion is not accurate. The Examiner appears to be referring to col. 2, line 45, of Dirschedl, which refers to using different types of modulation, namely 2PSK (binary phase-shift keying), 4PSK (quadrature phase-shift keying) or 8PSK (8-phase phase-shift keying). In the PSK nomenclature, the number in front of the "PSK" refers to the number of phases employed in the phase-shift keying modulation scheme. It does not refer to the number of bits employed per symbol.

Dirschedl also talks about determining the packet size based upon the error rate determination (col. 2, line 63 - col. 3, line 9). Applicant points out that determining packet size and determining symbol size are unrelated endeavors. Applicant submits that Dirschedl does not teach or suggest "the second transmitter transmitting a message to the first receiver that instructs the first transmitter to transmit data using a pre-selected number of bits per symbol if the maximum receive data rate is above the threshold, the second transmitter transmitting a message to the first receiver that instructs the first transmitter that it is free to transmit data using any integer number of bits per symbol if the maximum receive data rate is above the threshold" per claim 13.

For at least the above reasons, Applicant submits that claim 13, and claims 14-20 depending therefrom, are allowable over the cited art.

In view of the foregoing, Applicant respectfully requests allowance of claims 1-22.

The Commissioner is hereby authorized to charge any additional fees or credit any overpayment to the deposit account of McAndrews, Held & Malloy, Account No. 13-0017.

Respectfully submitted,

Date: August 16, 2007

MCANDREWS, HELD & MALLOY, LTD.

John A. Wiberg
Reg. No. 44,401
Tel.: 312 775 8000

McAndrews, Held & Malloy, Ltd.
500 West Madison Street
34th Floor
Chicago, IL 60661
Telephone: (312) 775-8000
Facsimile: (312) 775-8100